

Optimization of the epoxidation of methyl ester of palm fatty acid distillate.

ABSTRACT

Methyl ester of palm fatty acid distillate (PFAD-ME) can be used for producing epoxide compounds. PFADME consists of 39.3% of oleic acid (C18:1) and has an iodine value of 49.2 g I₂/100 g. It can be converted to a low oxirane content epoxide which can be used for several applications, such as plasticizers, polyols or alkanolamines, with appropriate modification. Temperature, mole ratio of hydrogen peroxide to unsaturation, and mole ratio of formic acid to unsaturation were optimized in the epoxidation of PFAD-ME. The study showed that more than 98% conversion of unsaturation to the epoxide ring moiety can be achieved within 3 hr of reaction by using the optimum molar ratio of 1:1:4 (unsaturation: formic acid: hydrogen peroxide) and a temperature of 50°C.

Keyword: Epoxidation; Palm fatty acid distillate; Hydrogen peroxide; Epoxidised vegetable oil.